

Carolina's mainland estuarine coastlines (Figure 1). Rates of shoreline recession are a function of shoreline type, geometry and composition, geographic location, size and shape of the associated coastal water body, coastal vegetation, water level, and storm frequency and intensity, all of which vary dramatically alongshore (Riggs and Ames, 2003). With SLR and shoreline recession, the function of any shorezone may be significantly altered by the transformation from one ecosystem class to another (e.g., from wetlands to open water) (Brinson et al., 1995).

Ultimately, to manage our coastal estuarine resources wisely and to maximize human utilization, long-term solutions to estuarine shoreline erosion problems must be in harmony with the dynamics of the entire coastal shoreline and shorezone system. This document summarizes the results of a multi-year, multidisciplinary study funded by NOAA and designed to address this need. The overall goal of the project was to evaluate mainland shoreline and shorezone compositional changes over four decades (1958-1998) within the Neuse River Estuary, a major component of the APES (Figure 2).

NORTH CAROLINA'S ESTUARINE SHORELINE

Due to the low topographic slopes on the coastal plain (less than 0.3 feet elevation for every horizontal mile), much of the coastal zone in northeastern North Carolina is within a few feet of current sea level (Figure 2). As a result, shoreline recession has consumed approximately 50 square miles of coastal lands over the past 25 years, more than half of which are critical wetland environments (Riggs and Ames, 2003). We cannot stop this natural process of estuarine shoreline recession in North Carolina. However, better knowledge of the consequences of SLR and associated shoreline recession would be economically, socially, and environmentally

advantageous. Below we summarize factors critical to understanding shoreline change and the dynamics of the estuarine shorezone in northeastern North Carolina estuaries.

Previous Work on Estuarine Shoreline Change

North Carolina's coastal zone (e.g., sounds and estuaries) are a product of post-glacial SLR and flooding of the stream valleys of the drainage systems. Estuarine shorezones have been geomorphologically classified into four basic categories: sediment bank, organic, combination, and back-barrier shorelines (Figure 3; Table 1; Riggs and Ames, 2003). Sediment bank shorezones tend to be steeply sloping, and often have a wave-cut scarp.

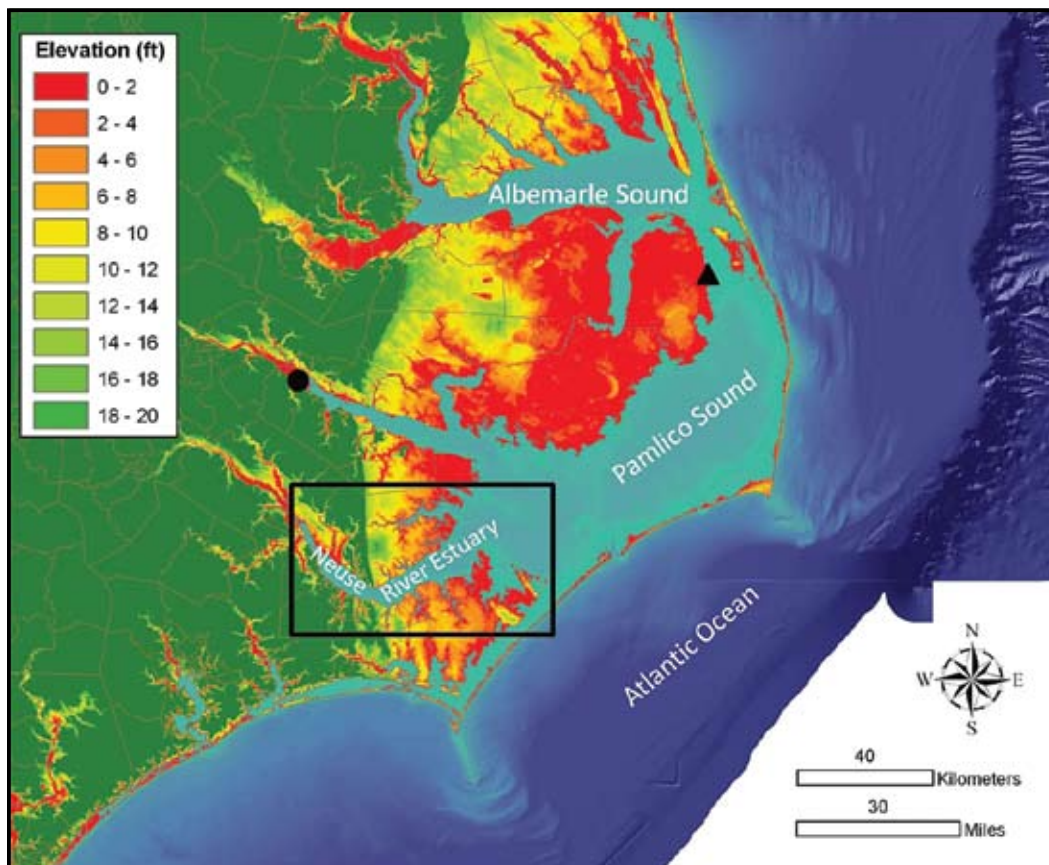


Figure 2. Elevation (LiDAR) map of coastal North Carolina showing the Albemarle-Pamlico estuarine system. Note that much of the region is extremely low lying (less than 2ft above sea level) and extremely susceptible to modification by storms and sea-level rise. The closed triangle and circle denote Point Peter Road and Bay Hills, respectively. The black box indicates the area shown in Figure 4 and 5.